BTEC Assignment Brief

Qualification	Pearson BTEC International Level 3 Subsidiary Diploma in Applied Science Pearson BTEC International Level 3 Foundation Diploma in Applied Science Pearson BTEC International Level 3 Diploma in Biomedical Science Pearson BTEC International Level 3 Extended Diploma in Biomedical Science
Unit number and title	**Unit 9: Biomedical Science**
Learning aim(s) (For NQF only)	**A**: Understand the principles of haematology and its use in medical diagnosis
Assignment title	**Composition of human blood**
Assessor	
Issue date	
Hand in deadline	

Vocational Scenario or Context	You are a laboratory technician in a pathology laboratory in a local hospital. As a biomedical science technician working in the medical sector you need a good understanding of the structure and function of blood components and to have appropriate practical analytical skills in testing blood samples to enable diagnosis of a range of blood related diseases. Your supervisor has set up some Continuing Professional Development (CPD) for you to ensure that your knowledge and skills remain up to date.

Task 1	As part of your CPD in your role of laboratory technician in a pathology laboratory, you are required to carry out diagnostic testing of blood. Your supervisor has also asked you to prepare a report that explains the structure and function of the main components of blood. Your work should be in two sections: **Section 1** is to look into the structure and function of blood and how this is affected by disease: • **Explain** the normal structure and function of each of the named blood components: Erythrocytes, Leucocytes, Thrombocytes, Plasma

and serum.

- Choose **TWO** diseases from the following list:
    - erythrocytic diseases associated with types of anaemia, thalassaemia, vitamin B12 and foliate deficiency, sickle cell anaemia
    - leucocytes (white blood cell) diseases associated with lymphocytosis, AIDS, infectious
    - mononucleosis
      o bone marrow failure
      o leukaemia
      o lymphomas such as Hodgkin and non-Hodgkin diseases
      o haemostasis and thrombosis, and their significance to the body of hepatitis B and C
      o syphilis
      o HIV
- For your chosen **TWO** diseases, provide a detailed **explanation** of how each might alter the normal structure, number and function of particular blood components, with reference to normal ranges in human.
- **Discuss** how diagnostic testing of blood relates to accurate identification of the two diseases. Demonstrate your knowledge of the reasoning behind the equipment and techniques that would be used in the hospital laboratory to carry out each diagnostic test, making judgements about the appropriate selection, implementation and interpretation of diagnostic tests by medical workers. **Evaluate** the basis and importance of the selection of specific blood tests that are likely to be carried out in order to confirm the preliminary diagnosis. Link the disease and blood composition and make judgements about the appropriate selection, implementation and interpretation of diagnostic tests by medical workers. Provide detailed consideration of the possible implications of misdiagnosis.

Section 2 is to carry out the diagnostic testing of blood

You should **carry out** a number of practical investigations of blood in order to determine the presence or absence of blood components that could indicate blood disorders.

- Investigations could include:
    - Spectrophotometric estimation of haemoglobin.
    - Preparation, staining and microscopic examination of blood films.
    - Erythrocyte counting using a haemocytometer or Neubauer counting chamber.
    - Haematocrit levels.

	● You must apply the principles behind haematological diagnostic techniques (counts of red blood cells and platelets, mean corpuscular and blood volumes, analysis for iron deficiency, coagulation/clotting, haemoglobin tests, blood grouping (typing))as appropriate. • You must demonstrate the ability to follow standard operating protocols provided by your supervisor to work methodically and accurately. You must also demonstrate awareness of good health and safety practices. Document (results, observations and conclusions) your practical diagnostic investigations on samples of blood. Your practical write-up and records of the practical work should have a good level of accuracy in results/observations obtained.
Checklist of evidence required	A report that includes: ● An explanation of the structure and function of the main components of blood and how diseases affect the normal composition of blood. ● A discussion relating to the basis of diagnostic tests for different diseases. ● An evaluation of the use of diagnostic testing of blood in relation to the detection of diseases ● Evidence to show the results of your practical investigation into diagnostic blood tests. Further evidence of completion of the practical investigation could be provided through an observation record completed by your Assessor.

Criteria covered by this task:	
Unit/Criteria reference	To achieve the criteria, you must show that you are able to:
A. D1	Evaluate the use of diagnostic testing of blood in relation to the detection of diseases.
A. M1	Discuss the basis of diagnostic tests for different diseases.
A. P1	Explain the structure and function of the main components of blood.
A. P2	Explain how diseases affect the composition of blood.
A. P3	Correctly carry out diagnostic testing of blood.
Sources of information to support you with this Assignment	All sources of information suggested are UK based. Centres are free to amend these sources to those available in the Country of delivery where more appropriate. http://labtestsonline.org.uk/

	http://www.nuffieldfoundation.org/practical-biology/closer-look-blood http://www.nuffieldfoundation.org/practical-biology/modelling-effect-aspirin-blood-clots http://www.scienceinschool.org/content/investigating-blood-types http://bitesizebio.com/13687/cell-counting-with-a-hemocytometer-easy-as-1-2-3/
Notes to Assessor and technician	The practical activities suggested for this assignment are required to be safety checked by the Centre before use. Pearson Education can take no responsibility for the safety of any practical activities. Before doing any practical activity, you should always carry out your own risk assessment and refer to the necessary regulations. In particular, any local rules issued by your employer must be obeyed, regardless of what is suggested here. Centre should use Health and Safety information provided by a reputable source. In the UK such an example organization is CLEAPSS http://science.cleapss.org.uk/Resource/SSS003-Human-body-fluids-and-tissues.pdf